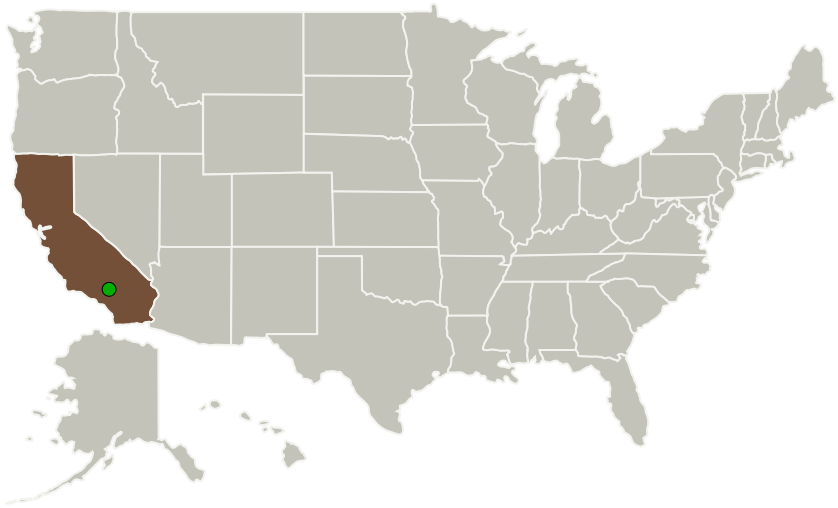
Fiber Optic Pressure Sensor Array, Phase II

Completed Technology Project (2011 - 2014)

Project Introduction

VIP Sensors proposes to develop a Fiber Optic Pressure Sensor Array System for measuring air flow pressure at multiple points on the skin of aircrafts for Flight Load Test applications. The array consists of multiple micro-miniature optical MEMS pressure sensors interconnected by a common optic fiber to an Interrogation Module located inside the airplane. The proposed optical pressure sensors are practically flat, light weight, fully passive (no electrical power), and EMI/RFI immune, they exhibit superior performance regarding accuracy, dynamic range and noise. They are inherently self identifiable; the interrogation system knows what data belongs to what sensor. The proposed sensor array technology is applicable to different types of optical sensors (accelerometers, strain, temperature, etc). Each sensor in the array is designed to work at preset optical wavelengths; they are read by the Interrogation Module using Wave Division and Time Division Multiplexing. Testing of aircrafts requires a large numbers of sensors. Each sensor needs four to six wires to interconnect to signal conditioners. For large measuring systems, this means very large numbers of wires that add weight and occupy space. The proposed FO sensor array system not only has the potential to significantly improve pressure measurements for Flight Load Testing, but its novel technology of micro-miniature networking sensors will benefit many other aircraft ground and flight testing applications.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
VIP Sensors	Lead Organization	Industry Minority-Owned Business	San Juan Capistrano, California
Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations
California

Project Transitions

June 2011: Project Start

May 2014: Closed out

Closeout Summary: Fiber Optic Pressure Sensor Array, Phase II Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138867)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

VIP Sensors

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Alexis G Karolys

Co-Investigator:

Alexis Karolys

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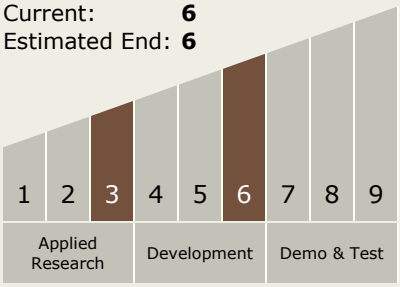
Completed Technology Project (2011 - 2014)

Technology Maturity (TRL)

Start: **3**
Current: **6**
Estimated End: **6**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.3 In-Situ Instruments and Sensors
    - TX08.3.4 Environment Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System